

Bottom Ash Data

2020 Week 45

The following analytical report was sent to the Ministry of Environment and Climate Change Strategy on December 7, 2020. The data represents bottom ash composite results for week 45 of 2020 (November 1, 2020 to November 7, 2020).

The bottom ash meets the requirements of Metro Vancouver's Bottom Ash Management Plan and is suitable for disposal.



CERTIFICATE OF ANALYSIS

Work Order : **VA20C0497**
Amendment : **1**
Client : **Covanta Burnaby Renewable Energy, ULC**
Contact : Steve McKinney
Address : 5150 Riverbend Drive
Burnaby BC Canada V3N 4V3
Telephone : 604 521 1025
Project : Weekly Bottom Ash - Suite
PO : VANCO 0000049378
C-O-C number : ----
Sampler : ----
Site : ----
Quote number : Standing Offer (BC work)
No. of samples received : 19
No. of samples analysed : 19

Page : 1 of 11
Laboratory : Vancouver - Environmental
Account Manager : Brent Mack
Address : 8081 Lougheed Highway
Burnaby BC Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 10-Nov-2020 13:35
Date Analysis Commenced : 13-Nov-2020
Issue Date : 04-Dec-2020 16:59

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Brianna Allen	Department Manager - Organics	Organics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Ophelia Chiu	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Robin Weeks	Team Leader - Metals	Metals, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
%	percent
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in reports identified as "Preliminary Report" are considered authorized for use.



Analytical Results

Sub-Matrix: Soil					Client sample ID	BA2045-A-1	BA2045-A-2	BA2045-A-3	BA2045-A-4	BA2045-A-5
(Matrix: Soil/Solid)					Client sampling date / time	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-001	VA20C0497-002	VA20C0497-003	VA20C0497-004	VA20C0497-005	
					Result	Result	Result	Result	Result	
Physical Tests										
moisture	----	E144	0.25	%	20.9	20.8	22.9	22.4	21.1	
pH (1:2 soil:water)	----	E108	0.10	pH units	10.5	10.6	10.6	10.4	10.5	
Metals										
aluminum	7429-90-5	E440	50	mg/kg	47700	40700	36200	29900	34100	
antimony	7440-36-0	E440	0.10	mg/kg	135	112	116	128	135	
arsenic	7440-38-2	E440	0.10	mg/kg	25.4	23.6	26.6	25.8	25.0	
barium	7440-39-3	E440	0.50	mg/kg	429	510	566	486	455	
beryllium	7440-41-7	E440	0.10	mg/kg	0.39	0.38	0.37	3.78	0.36	
bismuth	7440-69-9	E440	0.20	mg/kg	7.53	7.53	6.66	8.06	9.28	
boron	7440-42-8	E440	5.0	mg/kg	221	217	206	182	170	
cadmium	7440-43-9	E440	0.020	mg/kg	12.2	13.4	12.3	13.9	20.2	
calcium	7440-70-2	E440	50	mg/kg	116000	120000	113000	120000	117000	
chromium	7440-47-3	E440	0.50	mg/kg	171	272	142	266	148	
cobalt	7440-48-4	E440	0.10	mg/kg	25.3	149	44.7	22.2	33.7	
copper	7440-50-8	E440	0.50	mg/kg	1590	14500	2640	4540	2260	
iron	7439-89-6	E440	50	mg/kg	57600	79600	69300	74200	57900	
lead	7439-92-1	E440	0.50	mg/kg	348	396	353	1170	672	
lithium	7439-93-2	E440	2.0	mg/kg	22.0	18.3	19.4	18.3	21.8	
magnesium	7439-95-4	E440	20	mg/kg	9860	9990	11100	9970	9660	
manganese	7439-96-5	E440	1.0	mg/kg	680	847	908	873	723	
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500	
molybdenum	7439-98-7	E440	0.10	mg/kg	33.1	13.7	22.4	26.4	16.6	
nickel	7440-02-0	E440	0.50	mg/kg	125	106	241	207	126	
phosphorus	7723-14-0	E440	50	mg/kg	9240	9650	10400	10700	9470	
potassium	7440-09-7	E440	100	mg/kg	5150	4870	4940	5290	5050	
selenium	7782-49-2	E440	0.20	mg/kg	0.34	0.33	0.36	0.38	0.40	
silver	7440-22-4	E440	0.10	mg/kg	4.70	6.66	6.35	16.8	5.54	
sodium	7440-23-5	E440	50	mg/kg	13700	14300	15200	13900	12800	
strontium	7440-24-6	E440	0.50	mg/kg	258	306	248	278	338	
sulfur	7704-34-9	E440	1000	mg/kg	12300	14000	11600	13200	13200	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2045-A-1	BA2045-A-2	BA2045-A-3	BA2045-A-4	BA2045-A-5
Client sampling date / time					04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-001	VA20C0497-002	VA20C0497-003	VA20C0497-004	VA20C0497-005	
					Result	Result	Result	Result	Result	
Metals										
thallium	7440-28-0	E440	0.050	mg/kg	0.061	<0.050	<0.050	0.065	0.070	
tin	7440-31-5	E440	2.0	mg/kg	100	205	220	426	165	
titanium	7440-32-6	E440	1.0	mg/kg	661	1050	522	277	326	
tungsten	7440-33-7	E440	0.50	mg/kg	3.56	4.30	3.65	5.26	3.90	
uranium	7440-61-1	E440	0.050	mg/kg	4.52	4.40	4.37	5.07	4.90	
vanadium	7440-62-2	E440	0.20	mg/kg	48.9	51.4	45.6	52.4	64.6	
zinc	7440-66-6	E440	2.0	mg/kg	5390	4070	3220	5300	4350	
zirconium	7440-67-7	E440	1.0	mg/kg	2.0	1.3	1.2	1.3	1.4	
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.5	11.5	11.5	11.4	11.5	
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	8.25	7.24	7.32	6.29	8.01	
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.89	2.89	2.89	2.89	2.89	
pH, TCLP final	----	EPP444	0.010	pH units	6.21	6.02	6.17	6.06	6.12	
antimony, TCLP	7440-36-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5	
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025	
boron, TCLP	7440-42-8	E444	0.50	mg/L	1.98	2.07	1.97	1.87	2.08	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.268	0.249	0.254	0.253	0.895	
calcium, TCLP	7440-70-2	E444	10	mg/L	2080	2000	2070	2020	2020	
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	1.25	0.574	0.618	0.807	0.831	
copper, TCLP	7440-50-8	E444	0.050	mg/L	1.24	1.24	1.03	1.17	0.638	
iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	0.70	<0.25	0.65	<0.25	
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	130	131	135	134	135	
mercury, TCLP	7439-97-6	E512	0.0100	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.53	0.59	0.72	0.90	0.49	
selenium, TCLP	7782-49-2	E444	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00	
silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	
thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2045-A-1	BA2045-A-2	BA2045-A-3	BA2045-A-4	BA2045-A-5
Client sampling date / time					04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-001	VA20C0497-002	VA20C0497-003	VA20C0497-004	VA20C0497-005	
					Result	Result	Result	Result	Result	
TCLP Metals										
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
zinc, TCLP	7440-66-6	E444	0.50	mg/L	51.3	55.9	56.8	71.3	51.8	

Please refer to the General Comments section for an explanation of any qualifiers detected.



Analytical Results

Sub-Matrix: Soil					Client sample ID				
(Matrix: Soil/Solid)					BA2045-A-6	BA2045-A-7	BA2045-A-8	BA2045-A-9	BA2045-A-10
Client sampling date / time					04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-006	VA20C0497-007	VA20C0497-008	VA20C0497-009	VA20C0497-010
					Result	Result	Result	Result	Result
Physical Tests									
moisture	----	E144	0.25	%	21.3	22.6	22.0	21.9	21.4
pH (1:2 soil:water)	----	E108	0.10	pH units	10.4	10.6	10.6	10.5	10.5
Metals									
aluminum	7429-90-5	E440	50	mg/kg	44500	34000	29900	33000	38800
antimony	7440-36-0	E440	0.10	mg/kg	129	106	113	113	117
arsenic	7440-38-2	E440	0.10	mg/kg	25.2	20.0	22.3	23.9	24.4
barium	7440-39-3	E440	0.50	mg/kg	546	545	461	488	508
beryllium	7440-41-7	E440	0.10	mg/kg	0.43	0.37	0.40	0.36	0.37
bismuth	7440-69-9	E440	0.20	mg/kg	7.89	11.2	20.2	8.05	8.03
boron	7440-42-8	E440	5.0	mg/kg	213	154	167	184	183
cadmium	7440-43-9	E440	0.020	mg/kg	13.4	11.2	10.8	12.3	12.4
calcium	7440-70-2	E440	50	mg/kg	128000	120000	116000	112000	114000
chromium	7440-47-3	E440	0.50	mg/kg	136	133	142	151	178
cobalt	7440-48-4	E440	0.10	mg/kg	35.1	40.0	27.4	148	45.8
copper	7440-50-8	E440	0.50	mg/kg	1720	23500	897	1030	6280
iron	7439-89-6	E440	50	mg/kg	66000	54000	75000	112000	60600
lead	7439-92-1	E440	0.50	mg/kg	343	366	346	468	4190
lithium	7439-93-2	E440	2.0	mg/kg	22.0	21.2	18.8	19.3	17.3
magnesium	7439-95-4	E440	20	mg/kg	12400	11500	12200	8990	10900
manganese	7439-96-5	E440	1.0	mg/kg	773	682	827	931	717
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	<0.0500	<0.0500	<0.0500
molybdenum	7439-98-7	E440	0.10	mg/kg	20.5	55.2	16.0	14.6	20.9
nickel	7440-02-0	E440	0.50	mg/kg	148	6090	95.6	81.3	168
phosphorus	7723-14-0	E440	50	mg/kg	9870	8580	9670	8630	9860
potassium	7440-09-7	E440	100	mg/kg	5120	4740	5180	4510	4700
selenium	7782-49-2	E440	0.20	mg/kg	0.39	0.47	0.30	0.34	0.35
silver	7440-22-4	E440	0.10	mg/kg	3.54	5.17	3.24	3.10	3.60
sodium	7440-23-5	E440	50	mg/kg	14600	13300	14700	13700	13600
strontium	7440-24-6	E440	0.50	mg/kg	350	274	258	426	684
sulfur	7704-34-9	E440	1000	mg/kg	12800	10300	10700	11000	12500
thallium	7440-28-0	E440	0.050	mg/kg	0.060	<0.050	<0.050	<0.050	0.054



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2045-A-6	BA2045-A-7	BA2045-A-8	BA2045-A-9	BA2045-A-10
Client sampling date / time					04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-006	VA20C0497-007	VA20C0497-008	VA20C0497-009	VA20C0497-010	
					Result	Result	Result	Result	Result	
Metals										
tin	7440-31-5	E440	2.0	mg/kg	117	106	94.3	127	150	
titanium	7440-32-6	E440	1.0	mg/kg	489	311	341	371	718	
tungsten	7440-33-7	E440	0.50	mg/kg	5.51	3.16	2.75	2.90	4.55	
uranium	7440-61-1	E440	0.050	mg/kg	4.82	4.14	4.08	4.19	4.27	
vanadium	7440-62-2	E440	0.20	mg/kg	53.5	46.1	52.5	46.1	49.1	
zinc	7440-66-6	E440	2.0	mg/kg	4560	5450	3900	4230	5620	
zirconium	7440-67-7	E440	1.0	mg/kg	1.8	1.6	1.5	1.8	1.4	
TCLP Metals										
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.5	11.4	11.5	11.5	11.5	
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	7.04	8.36	8.15	8.75	8.52	
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.89	2.89	2.89	2.89	2.89	
pH, TCLP final	----	EPP444	0.010	pH units	6.00	6.01	6.23	6.12	6.08	
antimony, TCLP	7440-36-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	<2.5	<2.5	<2.5	
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	<0.025	<0.025	<0.025	
boron, TCLP	7440-42-8	E444	0.50	mg/L	1.93	1.99	2.31	2.04	1.98	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.225	0.298	1.38	0.237	0.283	
calcium, TCLP	7440-70-2	E444	10	mg/L	2000	1970	2040	2020	2050	
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	<0.25	<0.25	<0.25	
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	1.10	0.754	0.856	0.885	1.33	
copper, TCLP	7440-50-8	E444	0.050	mg/L	0.704	1.31	0.638	0.920	1.38	
iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	<5.0	<5.0	<5.0	
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	0.26	<0.25	<0.25	<0.25	
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	128	129	137	133	132	
mercury, TCLP	7439-97-6	E512	0.0100	mg/L	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.58	0.59	0.60	0.52	0.59	
selenium, TCLP	7782-49-2	E444	1.00	mg/L	<1.00	<1.00	<1.00	<1.00	<1.00	
silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	
thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	<0.15	<0.15	<0.15	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2045-A-6	BA2045-A-7	BA2045-A-8	BA2045-A-9	BA2045-A-10
Client sampling date / time					04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-006	VA20C0497-007	VA20C0497-008	VA20C0497-009	VA20C0497-010	
TCLP Metals					Result	Result	Result	Result	Result	
zinc, TCLP	7440-66-6	E444	0.50	mg/L	44.2	52.5	49.8	45.1	65.3	

Please refer to the General Comments section for an explanation of any qualifiers detected.



Analytical Results

Sub-Matrix: Soil

(Matrix: Soil/Solid)

Client sample ID

					BA2045-A-11	BA2045-A-12	BA2045-A-5 REP 1 Sample 005 REP 1	BA2045-A-5 REP 2 Sample 005 REP 2	BA2045-A-5 REP 3 Sample 005 REP 3
Client sampling date / time					04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-011	VA20C0497-012	VA20C0497-013	VA20C0497-014	VA20C0497-015
					Result	Result	Result	Result	Result
Physical Tests									
moisture	---	E144	0.25	%	20.0	21.2	---	---	---
pH (1:2 soil:water)	---	E108	0.10	pH units	10.6	10.8	---	---	---
Metals									
aluminum	7429-90-5	E440	50	mg/kg	34400	38600	---	---	---
antimony	7440-36-0	E440	0.10	mg/kg	142	136	---	---	---
arsenic	7440-38-2	E440	0.10	mg/kg	25.3	27.7	---	---	---
barium	7440-39-3	E440	0.50	mg/kg	520	563	---	---	---
beryllium	7440-41-7	E440	0.10	mg/kg	0.36	0.38	---	---	---
bismuth	7440-69-9	E440	0.20	mg/kg	11.5	15.2	---	---	---
boron	7440-42-8	E440	5.0	mg/kg	206	211	---	---	---
cadmium	7440-43-9	E440	0.020	mg/kg	14.5	11.0	---	---	---
calcium	7440-70-2	E440	50	mg/kg	124000	126000	---	---	---
chromium	7440-47-3	E440	0.50	mg/kg	428	119	---	---	---
cobalt	7440-48-4	E440	0.10	mg/kg	26.3	125	---	---	---
copper	7440-50-8	E440	0.50	mg/kg	2780	10400	---	---	---
iron	7439-89-6	E440	50	mg/kg	80300	49900	---	---	---
lead	7439-92-1	E440	0.50	mg/kg	399	302	---	---	---
lithium	7439-93-2	E440	2.0	mg/kg	18.9	38.3	---	---	---
magnesium	7439-95-4	E440	20	mg/kg	11300	10500	---	---	---
manganese	7439-96-5	E440	1.0	mg/kg	901	924	---	---	---
mercury	7439-97-6	E510	0.0500	mg/kg	<0.0500	<0.0500	---	---	---
molybdenum	7439-98-7	E440	0.10	mg/kg	20.1	14.9	---	---	---
nickel	7440-02-0	E440	0.50	mg/kg	220	268	---	---	---
phosphorus	7723-14-0	E440	50	mg/kg	9990	11200	---	---	---
potassium	7440-09-7	E440	100	mg/kg	5430	5050	---	---	---
selenium	7782-49-2	E440	0.20	mg/kg	0.40	0.35	---	---	---
silver	7440-22-4	E440.Ag	0.10	mg/kg	4.21	---	---	---	---
silver	7440-22-4	E440	0.10	mg/kg	---	4.82	---	---	---
sodium	7440-23-5	E440	50	mg/kg	15100	14100	---	---	---



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID	BA2045-A-11	BA2045-A-12	BA2045-A-5 REP 1 Sample 005 REP 1	BA2045-A-5 REP 2 Sample 005 REP 2	BA2045-A-5 REP 3 Sample 005 REP 3
Client sampling date / time					04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-011	VA20C0497-012	VA20C0497-013	VA20C0497-014	VA20C0497-015	
					Result	Result	Result	Result	Result	
Metals										
strontium	7440-24-6	E440	0.50	mg/kg	307	277	---	---	---	
sulfur	7704-34-9	E440	1000	mg/kg	13000	11500	---	---	---	
thallium	7440-28-0	E440	0.050	mg/kg	0.060	0.051	---	---	---	
tin	7440-31-5	E440	2.0	mg/kg	599	999	---	---	---	
titanium	7440-32-6	E440	1.0	mg/kg	596	571	---	---	---	
tungsten	7440-33-7	E440	0.50	mg/kg	5.05	6.11	---	---	---	
uranium	7440-61-1	E440	0.050	mg/kg	4.80	4.22	---	---	---	
vanadium	7440-62-2	E440	0.20	mg/kg	53.6	45.6	---	---	---	
zinc	7440-66-6	E440	2.0	mg/kg	8880	3440	---	---	---	
zirconium	7440-67-7	E440	1.0	mg/kg	1.3	1.4	---	---	---	
TCLP Metals										
pH, TCLP 1st preliminary	---	EPP444	0.010	pH units	11.5	11.6	11.5	11.5	11.5	
pH, TCLP 2nd preliminary	---	EPP444	0.010	pH units	8.39	8.51	8.01	8.01	8.01	
pH, TCLP extraction fluid initial	---	EPP444	0.010	pH units	2.89	2.89	2.91	2.91	2.91	
pH, TCLP final	---	EPP444	0.010	pH units	6.05	6.09	6.31	6.23	6.22	
antimony, TCLP	7440-36-0	E444	1.0	mg/L	<1.0	<1.0	---	---	---	
arsenic, TCLP	7440-38-2	E444	1.0	mg/L	<1.0	<1.0	---	---	---	
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	<2.5	---	---	---	
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	<0.025	---	---	---	
boron, TCLP	7440-42-8	E444	0.50	mg/L	2.02	2.03	---	---	---	
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.243	0.219	0.325	0.234	0.244	
calcium, TCLP	7440-70-2	E444	10	mg/L	2080	2100	---	---	---	
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	<0.25	---	---	---	
cobalt, TCLP	7440-48-4	E444	0.050	mg/L	0.772	0.802	---	---	---	
copper, TCLP	7440-50-8	E444	0.050	mg/L	1.33	1.15	---	---	---	
iron, TCLP	7439-89-6	E444	5.0	mg/L	<5.0	<5.0	---	---	---	
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	<0.25	---	---	---	
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	134	142	---	---	---	
mercury, TCLP	7439-97-6	E512	0.0100	mg/L	<0.0100	<0.0100	---	---	---	



Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID				
					BA2045-A-11	BA2045-A-12	BA2045-A-5 REP 1 Sample 005 REP 1	BA2045-A-5 REP 2 Sample 005 REP 2	BA2045-A-5 REP 3 Sample 005 REP 3
Client sampling date / time					04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-011	VA20C0497-012	VA20C0497-013	VA20C0497-014	VA20C0497-015
					Result	Result	Result	Result	Result
TCLP Metals									
nickel, TCLP	7440-02-0	E444	0.25	mg/L	0.52	0.54	----	----	----
selenium, TCLP	7782-49-2	E444	1.00	mg/L	<1.00	<1.00	----	----	----
silver, TCLP	7440-22-4	E444	0.050	mg/L	<0.050	<0.050	----	----	----
thallium, TCLP	7440-28-0	E444	1.0	mg/L	<1.0	<1.0	----	----	----
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	<0.15	----	----	----
zinc, TCLP	7440-66-6	E444	0.50	mg/L	46.5	46.1	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Soil (Matrix: Soil/Solid)					Client sample ID				
					BA2045-A-8 REP 1 Sample 008 REP 1	BA2045-A-8 REP 2 Sample 008 REP 2	BA2045-A-8 REP 3 Sample 008 REP 3	BA2045-A-8 REP	----
Client sampling date / time					04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020 09:00	04-Nov-2020	----
Analyte	CAS Number	Method	LOR	Unit	VA20C0497-016	VA20C0497-017	VA20C0497-018	VA20C0497-019	-----
					Result	Result	Result	Result	----
TCLP Metals									
pH, TCLP 1st preliminary	----	EPP444	0.010	pH units	11.5	11.5	11.5	11.5	----
pH, TCLP 2nd preliminary	----	EPP444	0.010	pH units	8.15	8.15	8.15	8.15	----
pH, TCLP extraction fluid initial	----	EPP444	0.010	pH units	2.91	2.91	2.91	2.89	----
pH, TCLP final	----	EPP444	0.010	pH units	6.24	6.21	6.21	6.21	----
cadmium, TCLP	7440-43-9	E444	0.050	mg/L	0.852	0.256	0.275	0.208	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA20C0497	Page	: 1 of 17
Amendment	: 1		
Client	: Covanta Burnaby Renewable Energy, ULC	Laboratory	: Vancouver - Environmental
Contact	: Steve McKinney	Account Manager	: Brent Mack
Address	: 5150 Riverbend Drive Burnaby BC Canada V3N 4V3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 521 1025	Telephone	: +1 604 253 4188
Project	: Weekly Bottom Ash - Suite	Date Samples Received	: 10-Nov-2020 13:35
PO	: VANCO 0000049378	Issue Date	: 04-Dec-2020 16:59
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Standing Offer (BC work)		
No. of samples received	: 19		
No. of samples analysed	: 19		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 15:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 15:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Metals : High Silver in Soil/Solid by CRC ICPMS											
LDPE bag BA2045-A-11	E440.Ag	04-Nov-2020	18-Nov-2020	180 days	14 days	✓	19-Nov-2020	165 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-1	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✓	16-Nov-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-10	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✓	16-Nov-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-11	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✓	16-Nov-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-12	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✓	16-Nov-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-2	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✓	16-Nov-2020	15 days	0 days	✓	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-3	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✓	16-Nov-2020	15 days	0 days	✓	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-4	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✔	16-Nov-2020	15 days	0 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-5	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✔	16-Nov-2020	15 days	0 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-6	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✔	16-Nov-2020	15 days	0 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-7	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✔	16-Nov-2020	15 days	0 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-8	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✔	16-Nov-2020	15 days	0 days	✔	
Metals : Mercury in Soil/Solid by CVAAS											
LDPE bag BA2045-A-9	E510	04-Nov-2020	16-Nov-2020	28 days	12 days	✔	16-Nov-2020	15 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2045-A-1	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2045-A-10	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPMS											
LDPE bag BA2045-A-11	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2045-A-12	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2045-A-2	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2045-A-3	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2045-A-4	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2045-A-5	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2045-A-6	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2045-A-7	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2045-A-8	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	
Metals : Metals in Soil/Solid by CRC ICPCS											
LDPE bag BA2045-A-9	E440	04-Nov-2020	16-Nov-2020	180 days	12 days	✔	16-Nov-2020	167 days	0 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2045-A-1	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2045-A-10	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2045-A-11	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2045-A-12	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2045-A-2	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2045-A-3	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2045-A-4	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2045-A-5	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag BA2045-A-6	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2045-A-7	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2045-A-8	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----		
Physical Tests : Moisture Content by Gravimetry											
LDPE bag BA2045-A-9	E144	04-Nov-2020	----	----	----		13-Nov-2020	----	----		
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-1	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-10	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-11	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-12	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-2	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-3	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-4	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-5	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-6	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-7	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-8	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
Physical Tests : pH by Meter (1:2 Soil:Water Extraction)											
LDPE bag BA2045-A-9	E108	04-Nov-2020	13-Nov-2020	30 days	9 days	✔	16-Nov-2020	20 days	3 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-1	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-10	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-11	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-12	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-2	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-3	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-4	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-5	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-6	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-7	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-8	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	
TCLP Metals : Mercury by CVAAS (TCLP)											
Glass vial - total (lab preserved) BA2045-A-9	E512	16-Nov-2020	----	----	----		18-Nov-2020	40 days	14 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-1	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-10	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-11	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-12	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-2	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-3	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-4	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-5	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-6	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-7	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-8	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE (lab preserved) BA2045-A-9	E444	16-Nov-2020	----	----	----		18-Nov-2020	192 days	14 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2045-A-5 REP 1 - Sample 005 REP 1	E444	25-Nov-2020	----	----	----		26-Nov-2020	201 days	22 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2045-A-5 REP 2 - Sample 005 REP 2	E444	25-Nov-2020	----	----	----		26-Nov-2020	201 days	22 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2045-A-5 REP 3 - Sample 005 REP 3	E444	25-Nov-2020	----	----	----		26-Nov-2020	201 days	22 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2045-A-8 REP 1 - Sample 008 REP 1	E444	25-Nov-2020	----	----	----		26-Nov-2020	201 days	22 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2045-A-8 REP 2 - Sample 008 REP 2	E444	25-Nov-2020	----	----	----		26-Nov-2020	201 days	22 days	✔	
TCLP Metals : Metals by CRC ICPMS (TCLP)											
HDPE - total (lab preserved) BA2045-A-8 REP 3 - Sample 008 REP 3	E444	25-Nov-2020	----	----	----		26-Nov-2020	201 days	22 days	✔	



Matrix: Soil/Solid

Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
TCLP Metals : Metals by CRC ICPMS (TCLP)										
HDPE total (nitric acid) BA2045-A-8 REP	E444	03-Dec-2020	----	----	----		04-Dec-2020	209 days	30 days	✓
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-1	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-10	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-11	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-12	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-2	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-3	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-4	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-5	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	



Matrix: Soil/Solid

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2045-A-5 REP 1 - Sample 005 REP 1	EPP444	04-Nov-2020	25-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2045-A-5 REP 2 - Sample 005 REP 2	EPP444	04-Nov-2020	25-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2045-A-5 REP 3 - Sample 005 REP 3	EPP444	04-Nov-2020	25-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-6	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-7	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-8	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2045-A-8 REP	EPP444	04-Nov-2020	03-Dec-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2045-A-8 REP 1 - Sample 008 REP 1	EPP444	04-Nov-2020	25-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2045-A-8 REP 2 - Sample 008 REP 2	EPP444	04-Nov-2020	25-Nov-2020	----	----		----	----	----	



Matrix: **Soil/Solid**

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 180 Day HT (e.g. metals ex. Hg) BA2045-A-8 REP 3 - Sample 008 REP 3	EPP444	04-Nov-2020	25-Nov-2020	----	----		----	----	----	
TCLP Metals : TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)										
Lab Split - Non-Volatile Leach: 28 day HT (e.g. Hg, CrVI) BA2045-A-9	EPP444	04-Nov-2020	16-Nov-2020	----	----		----	----	----	

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		Evaluation
			QC	Regular	Actual	Expected	
Analytical Methods							
Laboratory Duplicates (DUP)							
Mercury in Soil/Solid by CVAAS	E510	116683	1	15	6.6	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	116684	1	15	6.6	5.0	✔
Moisture Content by Gravimetry	E144	116685	1	12	8.3	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	116682	1	16	6.2	5.0	✔
Laboratory Control Samples (LCS)							
High Silver in Soil/Solid by CRC ICPMS	E440.Ag	119131	1	1	100.0	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	116683	2	15	13.3	10.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	116684	2	15	13.3	10.0	✔
Moisture Content by Gravimetry	E144	116685	1	12	8.3	5.0	✔
pH by Meter (1:2 Soil:Water Extraction)	E108	116682	1	16	6.2	5.0	✔
Method Blanks (MB)							
High Silver in Soil/Solid by CRC ICPMS	E440.Ag	119131	1	1	100.0	5.0	✔
Mercury by CVAAS (TCLP)	E512	118779	1	12	8.3	5.0	✔
Mercury in Soil/Solid by CVAAS	E510	116683	1	15	6.6	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	126052	3	19	15.7	5.0	✔
Metals in Soil/Solid by CRC ICPMS	E440	116684	1	15	6.6	5.0	✔
Moisture Content by Gravimetry	E144	116685	1	12	8.3	5.0	✔
Matrix Spikes (MS)							
Mercury by CVAAS (TCLP)	E512	118779	1	12	8.3	5.0	✔
Metals by CRC ICPMS (TCLP)	E444	126052	3	19	15.7	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
pH by Meter (1:2 Soil:Water Extraction)	E108 Vancouver - Environmental	Soil/Solid	BC Lab Manual	pH is determined by potentiometric measurement with a pH electrode at ambient laboratory temperature (normally 20 ± 5°C), and is carried out in accordance with procedures described in the BC Lab Manual (prescriptive method). The procedure involves mixing the dried (at <60 °C) and sieved (10mesh/2mm) sample with ultra pure water at a 1:2 ratio of sediment to water. The pH is then measured by a standard pH probe.
Moisture Content by Gravimetry	E144 Vancouver - Environmental	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Metals in Soil/Solid by CRC ICPMS	E440 Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.
High Silver in Soil/Solid by CRC ICPMS	E440.Ag Vancouver - Environmental	Soil/Solid	EPA 6020B (mod)	Samples are sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.
Metals by CRC ICPMS (TCLP)	E444 Vancouver - Environmental	Soil/Solid	EPA 1311/6020B (mod)	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by Collision/Reaction Cell ICPMS.
Mercury in Soil/Solid by CVAAS	E510 Vancouver - Environmental	Soil/Solid	EPA 200.2/1631 Appendix (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl, followed by CVAAS analysis.
Mercury by CVAAS (TCLP)	E512 Vancouver - Environmental	Soil/Solid	SW 846 -1311/245.1 CVAA ON TCLP LEACHATE	An extract produced by the Toxicity Characteristic Leachate Procedure (TCLP) as per EPA 1311 is analyzed by CVAAS.
Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Leach 1:2 Soil:Water for pH/EC	EP108 Vancouver - Environmental	Soil/Solid	BC WLAP METHOD: PH, ELECTROMETRIC, SOIL	The procedure involves mixing the dried (at <60°C) and sieved (No. 10 / 2mm) sample with deionized/distilled water at a 1:2 ratio of sediment to water.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Digestion for Metals and Mercury	EP440 Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available.
Digestion for Silver	EP440.Ag Vancouver - Environmental	Soil/Solid	EPA 200.2 (mod)	Samples are dried, then sieved through a 2 mm sieve, and digested with HNO ₃ and HCl. This method is intended to liberate metals that may be environmentally available.
TCLP Leachate Preparation (Metals, Inorganics, and SVOCs)	EPP444 Vancouver - Environmental	Soil/Solid	EPA 1311	Preparation of a Toxicity Characteristic Leaching Procedure (TCLP) solid sample involves particle size reduction, homogenization, then determination of appropriate extraction fluid. A measured portion of fresh subsample is placed in an extraction bottle with the appropriate extraction fluid then tumbled in a rotary extractor for 18+/- 2 hours at 23 +/- 2 C. The liquid leachate is filtered to separate from solids then bottled and prepared for analytical tests.



QUALITY CONTROL REPORT

Work Order : VA20C0497
Amendment : 1

Page : 1 of 14

Client : Covanta Burnaby Renewable Energy, ULC
Contact : Steve McKinney
Address : 5150 Riverbend Drive
Burnaby BC Canada V3N 4V3
Telephone : 604 521 1025
Project : Weekly Bottom Ash - Suite
PO : VANCO 0000049378
C-O-C number : ---
Sampler : ---
Site : ---
Quote number : Standing Offer (BC work)
No. of samples received : 19
No. of samples analysed : 19

Laboratory : Vancouver - Environmental
Account Manager : Brent Mack
Address : 8081 Lougheed Highway
Burnaby, British Columbia Canada V5A 1W9
Telephone : +1 604 253 4188
Date Samples Received : 10-Nov-2020 13:35
Date Analysis Commenced : 13-Nov-2020
Issue Date : 04-Dec-2020 16:59

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
Matrix Spike (MS) Report; Recovery and Acceptance Limits
Reference Material (RM) Report; Recovery and Acceptance Limits
Method Blank (MB) Report; Recovery and Acceptance Limits
Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Table with 3 columns: Signatories, Position, Laboratory Department. Rows include Brianna Allen, Kim Jensen, Ophelia Chiu, and Robin Weeks with their respective roles and departments.



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percentage Difference

= Indicates a QC result that did not meet the ALS DQO.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Soil/Solid

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 116682)											
VA20C0328-007	Anonymous	pH (1:2 soil:water)	----	E108	0.10	pH units	8.14	8.18	0.490%	5%	----
Physical Tests (QC Lot: 116685)											
VA20C0497-001	BA2045-A-1	moisture	----	E144	0.25	%	20.9	20.9	0.105%	20%	----
Metals (QC Lot: 116683)											
VA20C0328-007	Anonymous	mercury	7439-97-6	E510	0.0050	mg/kg	0.212	0.190	10.6%	40%	----
Metals (QC Lot: 116684)											
VA20C0328-007	Anonymous	aluminum	7429-90-5	E440	50	mg/kg	16900	16400	2.83%	40%	----
		antimony	7440-36-0	E440	0.10	mg/kg	0.71	0.69	2.13%	30%	----
		arsenic	7440-38-2	E440	0.10	mg/kg	10.3	9.28	10.7%	30%	----
		barium	7440-39-3	E440	0.50	mg/kg	156	134	15.1%	40%	----
		beryllium	7440-41-7	E440	0.10	mg/kg	0.49	0.44	0.06	Diff <2x LOR	----
		bismuth	7440-69-9	E440	0.20	mg/kg	<0.20	<0.20	0	Diff <2x LOR	----
		boron	7440-42-8	E440	5.0	mg/kg	8.3	6.9	1.4	Diff <2x LOR	----
		cadmium	7440-43-9	E440	0.020	mg/kg	0.242	0.216	11.2%	30%	----
		calcium	7440-70-2	E440	50	mg/kg	13900	13300	4.14%	30%	----
		chromium	7440-47-3	E440	0.50	mg/kg	55.0	49.7	10.1%	30%	----
		cobalt	7440-48-4	E440	0.10	mg/kg	14.8	14.5	1.70%	30%	----
		copper	7440-50-8	E440	0.50	mg/kg	330	283	15.2%	30%	----
		iron	7439-89-6	E440	50	mg/kg	33800	31100	8.10%	30%	----
		lead	7439-92-1	E440	0.50	mg/kg	7.78	6.88	12.3%	40%	----
		lithium	7439-93-2	E440	2.0	mg/kg	9.2	9.2	0.02	Diff <2x LOR	----
		magnesium	7439-95-4	E440	20	mg/kg	11900	12400	4.08%	30%	----
		manganese	7439-96-5	E440	1.0	mg/kg	821	782	4.90%	30%	----
		molybdenum	7439-98-7	E440	0.10	mg/kg	1.41	1.36	3.06%	40%	----
		nickel	7440-02-0	E440	0.50	mg/kg	39.6	37.6	5.18%	30%	----
		phosphorus	7723-14-0	E440	50	mg/kg	1420	1350	5.29%	30%	----
		potassium	7440-09-7	E440	100	mg/kg	2870	2610	9.58%	40%	----
		selenium	7782-49-2	E440	0.20	mg/kg	0.34	0.32	0.02	Diff <2x LOR	----
		silver	7440-22-4	E440	0.10	mg/kg	0.23	0.20	0.02	Diff <2x LOR	----
		sodium	7440-23-5	E440	50	mg/kg	762	761	0.163%	40%	----
		strontium	7440-24-6	E440	0.50	mg/kg	104	94.5	9.59%	40%	----
		sulfur	7704-34-9	E440	1000	mg/kg	<1000	<1000	0	Diff <2x LOR	----



Sub-Matrix: **Soil/Solid**

Laboratory Duplicate (DUP) Report

<i>Laboratory sample ID</i>	<i>Client sample ID</i>	<i>Analyte</i>	<i>CAS Number</i>	<i>Method</i>	<i>LOR</i>	<i>Unit</i>	<i>Original Result</i>	<i>Duplicate Result</i>	<i>RPD(%) or Difference</i>	<i>Duplicate Limits</i>	<i>Qualifier</i>
Metals (QC Lot: 116684) - continued											
VA20C0328-007	Anonymous	thallium	7440-28-0	E440	0.050	mg/kg	0.138	0.121	0.016	Diff <2x LOR	----
		tin	7440-31-5	E440	2.0	mg/kg	<2.0	<2.0	0	Diff <2x LOR	----
		titanium	7440-32-6	E440	1.0	mg/kg	1000	900	10.7%	40%	----
		tungsten	7440-33-7	E440	0.50	mg/kg	<0.50	<0.50	0	Diff <2x LOR	----
		uranium	7440-61-1	E440	0.050	mg/kg	0.514	0.457	11.7%	30%	----
		vanadium	7440-62-2	E440	0.20	mg/kg	110	103	6.50%	30%	----
		zinc	7440-66-6	E440	2.0	mg/kg	77.0	73.8	4.20%	30%	----
		zirconium	7440-67-7	E440	1.0	mg/kg	3.8	3.9	0.09	Diff <2x LOR	----



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 116685)						
moisture	----	E144	0.25	%	<0.25	----
Metals (QCLot: 116683)						
mercury	7439-97-6	E510	0.005	mg/kg	<0.0050	----
Metals (QCLot: 116684)						
aluminum	7429-90-5	E440	50	mg/kg	<50	----
antimony	7440-36-0	E440	0.1	mg/kg	<0.10	----
arsenic	7440-38-2	E440	0.1	mg/kg	<0.10	----
barium	7440-39-3	E440	0.5	mg/kg	<0.50	----
beryllium	7440-41-7	E440	0.1	mg/kg	<0.10	----
bismuth	7440-69-9	E440	0.2	mg/kg	<0.20	----
boron	7440-42-8	E440	5	mg/kg	<5.0	----
cadmium	7440-43-9	E440	0.02	mg/kg	<0.020	----
calcium	7440-70-2	E440	50	mg/kg	<50	----
chromium	7440-47-3	E440	0.5	mg/kg	<0.50	----
cobalt	7440-48-4	E440	0.1	mg/kg	<0.10	----
copper	7440-50-8	E440	0.5	mg/kg	<0.50	----
iron	7439-89-6	E440	50	mg/kg	<50	----
lead	7439-92-1	E440	0.5	mg/kg	<0.50	----
lithium	7439-93-2	E440	2	mg/kg	<2.0	----
magnesium	7439-95-4	E440	20	mg/kg	<20	----
manganese	7439-96-5	E440	1	mg/kg	<1.0	----
molybdenum	7439-98-7	E440	0.1	mg/kg	<0.10	----
nickel	7440-02-0	E440	0.5	mg/kg	<0.50	----
phosphorus	7723-14-0	E440	50	mg/kg	<50	----
potassium	7440-09-7	E440	100	mg/kg	<100	----
selenium	7782-49-2	E440	0.2	mg/kg	<0.20	----
silver	7440-22-4	E440	0.1	mg/kg	<0.10	----
sodium	7440-23-5	E440	50	mg/kg	<50	----
strontium	7440-24-6	E440	0.5	mg/kg	<0.50	----
sulfur	7704-34-9	E440	1000	mg/kg	<1000	----
thallium	7440-28-0	E440	0.05	mg/kg	<0.050	----
tin	7440-31-5	E440	2	mg/kg	<2.0	----
titanium	7440-32-6	E440	1	mg/kg	<1.0	----



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Metals (QCLot: 116684) - continued						
tungsten	7440-33-7	E440	0.5	mg/kg	<0.50	---
uranium	7440-61-1	E440	0.05	mg/kg	<0.050	---
vanadium	7440-62-2	E440	0.2	mg/kg	<0.20	---
zinc	7440-66-6	E440	2	mg/kg	<2.0	---
zirconium	7440-67-7	E440	1	mg/kg	<1.0	---
Metals (QCLot: 119131)						
silver	7440-22-4	E440.Ag	0.1	mg/kg	<0.10	---
TCLP Metals (QCLot: 118779)						
mercury, TCLP	7439-97-6	E512	0.001	mg/L	<0.0010	---
TCLP Metals (QCLot: 118780)						
antimony, TCLP	7440-36-0	E444	1	mg/L	<1.0	---
arsenic, TCLP	7440-38-2	E444	1	mg/L	<1.0	---
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	---
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	---
boron, TCLP	7440-42-8	E444	0.5	mg/L	<0.50	---
cadmium, TCLP	7440-43-9	E444	0.05	mg/L	<0.050	---
calcium, TCLP	7440-70-2	E444	10	mg/L	<10	---
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	---
cobalt, TCLP	7440-48-4	E444	0.05	mg/L	<0.050	---
copper, TCLP	7440-50-8	E444	0.05	mg/L	<0.050	---
iron, TCLP	7439-89-6	E444	5	mg/L	<5.0	---
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	---
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	<2.5	---
nickel, TCLP	7440-02-0	E444	0.25	mg/L	<0.25	---
selenium, TCLP	7782-49-2	E444	0.1	mg/L	<0.10	---
silver, TCLP	7440-22-4	E444	0.05	mg/L	<0.050	---
thallium, TCLP	7440-28-0	E444	1	mg/L	<1.0	---
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	---
zinc, TCLP	7440-66-6	E444	0.5	mg/L	<0.50	---
TCLP Metals (QCLot: 122523)						
antimony, TCLP	7440-36-0	E444	1	mg/L	<1.0	---
arsenic, TCLP	7440-38-2	E444	1	mg/L	<1.0	---
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	---
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	---
boron, TCLP	7440-42-8	E444	0.5	mg/L	<0.50	---
cadmium, TCLP	7440-43-9	E444	0.05	mg/L	<0.050	---



Sub-Matrix: Soil/Solid

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
TCLP Metals (QCLot: 122523) - continued						
calcium, TCLP	7440-70-2	E444	10	mg/L	<10	----
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	----
cobalt, TCLP	7440-48-4	E444	0.05	mg/L	<0.050	----
copper, TCLP	7440-50-8	E444	0.05	mg/L	<0.050	----
iron, TCLP	7439-89-6	E444	5	mg/L	<5.0	----
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	----
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	<2.5	----
nickel, TCLP	7440-02-0	E444	0.25	mg/L	<0.25	----
selenium, TCLP	7782-49-2	E444	0.1	mg/L	<0.10	----
silver, TCLP	7440-22-4	E444	0.05	mg/L	<0.050	----
thallium, TCLP	7440-28-0	E444	1	mg/L	<1.0	----
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	----
zinc, TCLP	7440-66-6	E444	0.5	mg/L	<0.50	----
TCLP Metals (QCLot: 126052)						
antimony, TCLP	7440-36-0	E444	1	mg/L	<1.0	----
arsenic, TCLP	7440-38-2	E444	1	mg/L	<1.0	----
barium, TCLP	7440-39-3	E444	2.5	mg/L	<2.5	----
beryllium, TCLP	7440-41-7	E444	0.025	mg/L	<0.025	----
boron, TCLP	7440-42-8	E444	0.5	mg/L	<0.50	----
cadmium, TCLP	7440-43-9	E444	0.05	mg/L	<0.050	----
calcium, TCLP	7440-70-2	E444	10	mg/L	<10	----
chromium, TCLP	7440-47-3	E444	0.25	mg/L	<0.25	----
cobalt, TCLP	7440-48-4	E444	0.05	mg/L	<0.050	----
copper, TCLP	7440-50-8	E444	0.05	mg/L	<0.050	----
iron, TCLP	7439-89-6	E444	5	mg/L	<5.0	----
lead, TCLP	7439-92-1	E444	0.25	mg/L	<0.25	----
magnesium, TCLP	7439-95-4	E444	2.5	mg/L	<2.5	----
nickel, TCLP	7440-02-0	E444	0.25	mg/L	<0.25	----
selenium, TCLP	7782-49-2	E444	0.1	mg/L	<0.10	----
silver, TCLP	7440-22-4	E444	0.05	mg/L	<0.050	----
thallium, TCLP	7440-28-0	E444	1	mg/L	<1.0	----
vanadium, TCLP	7440-62-2	E444	0.15	mg/L	<0.15	----
zinc, TCLP	7440-66-6	E444	0.5	mg/L	<0.50	----





Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 116682)									
pH (1:2 soil:water)	----	E108	----	pH units	6 pH units	99.5	95.0	105	----
Physical Tests (QCLot: 116685)									
moisture	----	E144	0.25	%	50 %	99.4	90.0	110	----
Metals (QCLot: 116683)									
mercury	7439-97-6	E510	0.005	mg/kg	0.1 mg/kg	99.3	80.0	120	----
Metals (QCLot: 116684)									
aluminum	7429-90-5	E440	50	mg/kg	200 mg/kg	109	80.0	120	----
antimony	7440-36-0	E440	0.1	mg/kg	100 mg/kg	113	80.0	120	----
arsenic	7440-38-2	E440	0.1	mg/kg	100 mg/kg	110	80.0	120	----
barium	7440-39-3	E440	0.5	mg/kg	25 mg/kg	104	80.0	120	----
beryllium	7440-41-7	E440	0.1	mg/kg	10 mg/kg	107	80.0	120	----
bismuth	7440-69-9	E440	0.2	mg/kg	100 mg/kg	104	80.0	120	----
boron	7440-42-8	E440	5	mg/kg	100 mg/kg	101	80.0	120	----
cadmium	7440-43-9	E440	0.02	mg/kg	10 mg/kg	110	80.0	120	----
calcium	7440-70-2	E440	50	mg/kg	5000 mg/kg	108	80.0	120	----
chromium	7440-47-3	E440	0.5	mg/kg	25 mg/kg	110	80.0	120	----
cobalt	7440-48-4	E440	0.1	mg/kg	25 mg/kg	107	80.0	120	----
copper	7440-50-8	E440	0.5	mg/kg	25 mg/kg	107	80.0	120	----
iron	7439-89-6	E440	50	mg/kg	100 mg/kg	111	80.0	120	----
lead	7439-92-1	E440	0.5	mg/kg	50 mg/kg	105	80.0	120	----
lithium	7439-93-2	E440	2	mg/kg	25 mg/kg	105	80.0	120	----
magnesium	7439-95-4	E440	20	mg/kg	5000 mg/kg	107	80.0	120	----
manganese	7439-96-5	E440	1	mg/kg	25 mg/kg	107	80.0	120	----
molybdenum	7439-98-7	E440	0.1	mg/kg	25 mg/kg	112	80.0	120	----
nickel	7440-02-0	E440	0.5	mg/kg	50 mg/kg	107	80.0	120	----
phosphorus	7723-14-0	E440	50	mg/kg	1000 mg/kg	118	80.0	120	----
potassium	7440-09-7	E440	100	mg/kg	5000 mg/kg	113	80.0	120	----
selenium	7782-49-2	E440	0.2	mg/kg	100 mg/kg	110	80.0	120	----
silver	7440-22-4	E440	0.1	mg/kg	10 mg/kg	111	80.0	120	----
sodium	7440-23-5	E440	50	mg/kg	5000 mg/kg	113	80.0	120	----
strontium	7440-24-6	E440	0.5	mg/kg	25 mg/kg	107	80.0	120	----
sulfur	7704-34-9	E440	1000	mg/kg	5000 mg/kg	102	80.0	120	----
thallium	7440-28-0	E440	0.05	mg/kg	100 mg/kg	105	80.0	120	----



Sub-Matrix: Soil/Solid

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Metals (QCLot: 116684) - continued									
tin	7440-31-5	E440	2	mg/kg	50 mg/kg	112	80.0	120	----
titanium	7440-32-6	E440	1	mg/kg	25 mg/kg	109	80.0	120	----
tungsten	7440-33-7	E440	0.5	mg/kg	10 mg/kg	106	80.0	120	----
uranium	7440-61-1	E440	0.05	mg/kg	0.5 mg/kg	106	80.0	120	----
vanadium	7440-62-2	E440	0.2	mg/kg	50 mg/kg	108	80.0	120	----
zinc	7440-66-6	E440	2	mg/kg	50 mg/kg	111	80.0	120	----
zirconium	7440-67-7	E440	1	mg/kg	10 mg/kg	105	80.0	120	----
Metals (QCLot: 119131)									
silver	7440-22-4	E440.Ag	0.1	mg/kg	10 mg/kg	105	80.0	120	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: Soil/Solid

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
TCLP Metals (QCLot: 118779)										
VA20C0497-001	BA2045-A-1	mercury, TCLP	7439-97-6	E512	0.0010 mg/L	0.001 mg/L	103	50.0	140	----
TCLP Metals (QCLot: 118780)										
VA20C0497-001	BA2045-A-1	antimony, TCLP	7440-36-0	E444	5.3 mg/L	5 mg/L	105	50.0	140	----
		arsenic, TCLP	7440-38-2	E444	4.9 mg/L	5 mg/L	98.1	50.0	140	----
		barium, TCLP	7440-39-3	E444	13.7 mg/L	12.5 mg/L	109	50.0	140	----
		beryllium, TCLP	7440-41-7	E444	0.224 mg/L	0.25 mg/L	89.5	50.0	140	----
		boron, TCLP	7440-42-8	E444	8.81 mg/L	10 mg/L	88.1	50.0	140	----
		cadmium, TCLP	7440-43-9	E444	ND mg/L	0.25 mg/L	ND	50.0	140	----
		calcium, TCLP	7440-70-2	E444	ND mg/L	250 mg/L	ND	50.0	140	----
		chromium, TCLP	7440-47-3	E444	1.23 mg/L	1.25 mg/L	98.1	50.0	140	----
		cobalt, TCLP	7440-48-4	E444	ND mg/L	0.25 mg/L	ND	50.0	140	----
		copper, TCLP	7440-50-8	E444	2.32 mg/L	2.5 mg/L	92.9	50.0	140	----
		iron, TCLP	7439-89-6	E444	242 mg/L	250 mg/L	96.8	50.0	140	----
		lead, TCLP	7439-92-1	E444	10.2 mg/L	10 mg/L	102	50.0	140	----
		magnesium, TCLP	7439-95-4	E444	265 mg/L	250 mg/L	106	50.0	140	----
		nickel, TCLP	7440-02-0	E444	2.34 mg/L	2.5 mg/L	93.5	50.0	140	----
		selenium, TCLP	7782-49-2	E444	4.89 mg/L	5 mg/L	97.9	50.0	140	----
		silver, TCLP	7440-22-4	E444	0.115 mg/L	0.1 mg/L	115	50.0	140	----
		thallium, TCLP	7440-28-0	E444	4.9 mg/L	5 mg/L	97.9	50.0	140	----
		vanadium, TCLP	7440-62-2	E444	0.75 mg/L	0.75 mg/L	100	50.0	140	----
		zinc, TCLP	7440-66-6	E444	ND mg/L	10 mg/L	ND	50.0	140	----
TCLP Metals (QCLot: 122523)										
VA20C0497-013	BA2045-A-5 REP 1 Sample 005 REP 1	antimony, TCLP	7440-36-0	E444	4.8 mg/L	5 mg/L	95.2	50.0	140	----
		arsenic, TCLP	7440-38-2	E444	4.8 mg/L	5 mg/L	95.7	50.0	140	----
		barium, TCLP	7440-39-3	E444	11.4 mg/L	12.5 mg/L	91.1	50.0	140	----
		beryllium, TCLP	7440-41-7	E444	0.244 mg/L	0.25 mg/L	97.6	50.0	140	----
		boron, TCLP	7440-42-8	E444	8.88 mg/L	10 mg/L	88.8	50.0	140	----
		cadmium, TCLP	7440-43-9	E444	ND mg/L	0.25 mg/L	ND	50.0	140	----
		calcium, TCLP	7440-70-2	E444	ND mg/L	250 mg/L	ND	50.0	140	----
		chromium, TCLP	7440-47-3	E444	1.19 mg/L	1.25 mg/L	95.5	50.0	140	----
		cobalt, TCLP	7440-48-4	E444	ND mg/L	0.25 mg/L	ND	50.0	140	----



Sub-Matrix: Soil/Solid

					Matrix Spike (MS) Report					
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Spike		Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	Target	MS	Low	High	
TCLP Metals (QCLot: 122523) - continued										
VA20C0497-013	BA2045-A-5 REP 1 Sample 005 REP 1	copper, TCLP	7440-50-8	E444	2.29 mg/L	2.5 mg/L	91.7	50.0	140	----
		iron, TCLP	7439-89-6	E444	226 mg/L	250 mg/L	90.4	50.0	140	----
		lead, TCLP	7439-92-1	E444	9.54 mg/L	10 mg/L	95.4	50.0	140	----
		magnesium, TCLP	7439-95-4	E444	228 mg/L	250 mg/L	91.3	50.0	140	----
		nickel, TCLP	7440-02-0	E444	2.29 mg/L	2.5 mg/L	91.7	50.0	140	----
		selenium, TCLP	7782-49-2	E444	4.94 mg/L	5 mg/L	98.7	50.0	140	----
		silver, TCLP	7440-22-4	E444	0.108 mg/L	0.1 mg/L	108	50.0	140	----
		thallium, TCLP	7440-28-0	E444	4.5 mg/L	5 mg/L	90.9	50.0	140	----
		vanadium, TCLP	7440-62-2	E444	0.73 mg/L	0.75 mg/L	97.7	50.0	140	----
		zinc, TCLP	7440-66-6	E444	ND mg/L	10 mg/L	ND	50.0	140	----
TCLP Metals (QCLot: 126052)										
VA20C0497-019	BA2045-A-8 REP	antimony, TCLP	7440-36-0	E444	5.0 mg/L	5 mg/L	100	50.0	140	----
		arsenic, TCLP	7440-38-2	E444	5.1 mg/L	5 mg/L	102	50.0	140	----
		barium, TCLP	7440-39-3	E444	12.9 mg/L	12.5 mg/L	103	50.0	140	----
		beryllium, TCLP	7440-41-7	E444	0.244 mg/L	0.25 mg/L	97.5	50.0	140	----
		boron, TCLP	7440-42-8	E444	10.1 mg/L	10 mg/L	101	50.0	140	----
		cadmium, TCLP	7440-43-9	E444	0.251 mg/L	0.25 mg/L	100	50.0	140	----
		calcium, TCLP	7440-70-2	E444	ND mg/L	250 mg/L	ND	50.0	140	----
		chromium, TCLP	7440-47-3	E444	1.28 mg/L	1.25 mg/L	102	50.0	140	----
		cobalt, TCLP	7440-48-4	E444	ND mg/L	0.25 mg/L	ND	50.0	140	----
		copper, TCLP	7440-50-8	E444	2.56 mg/L	2.5 mg/L	103	50.0	140	----
		iron, TCLP	7439-89-6	E444	248 mg/L	250 mg/L	99.1	50.0	140	----
		lead, TCLP	7439-92-1	E444	9.80 mg/L	10 mg/L	98.0	50.0	140	----
		magnesium, TCLP	7439-95-4	E444	242 mg/L	250 mg/L	96.8	50.0	140	----
		nickel, TCLP	7440-02-0	E444	2.56 mg/L	2.5 mg/L	102	50.0	140	----
		selenium, TCLP	7782-49-2	E444	4.92 mg/L	5 mg/L	98.3	50.0	140	----
		silver, TCLP	7440-22-4	E444	0.110 mg/L	0.1 mg/L	110	50.0	140	----
		thallium, TCLP	7440-28-0	E444	4.5 mg/L	5 mg/L	90.4	50.0	140	----
vanadium, TCLP	7440-62-2	E444	0.81 mg/L	0.75 mg/L	108	50.0	140	----		
		zinc, TCLP	7440-66-6	E444	ND mg/L	10 mg/L	ND	50.0	140	----



Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix: **Soil/Solid**

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 116683)									
QC-116683-003	SCP SS-2	mercury	7439-97-6	E510	0.059 mg/kg	102	70.0	130	----
Metals (QCLot: 116684)									
QC-116684-003	SCP SS-2	aluminum	7429-90-5	E440	9817 mg/kg	106	70.0	130	----
QC-116684-003	SCP SS-2	antimony	7440-36-0	E440	3.99 mg/kg	96.2	70.0	130	----
QC-116684-003	SCP SS-2	arsenic	7440-38-2	E440	3.73 mg/kg	106	70.0	130	----
QC-116684-003	SCP SS-2	barium	7440-39-3	E440	105 mg/kg	104	70.0	130	----
QC-116684-003	SCP SS-2	beryllium	7440-41-7	E440	0.349 mg/kg	106	70.0	130	----
QC-116684-003	SCP SS-2	boron	7440-42-8	E440	8.5 mg/kg	119	40.0	160	----
QC-116684-003	SCP SS-2	cadmium	7440-43-9	E440	0.91 mg/kg	101	70.0	130	----
QC-116684-003	SCP SS-2	calcium	7440-70-2	E440	31082 mg/kg	101	70.0	130	----
QC-116684-003	SCP SS-2	chromium	7440-47-3	E440	101 mg/kg	116	70.0	130	----
QC-116684-003	SCP SS-2	cobalt	7440-48-4	E440	6.9 mg/kg	104	70.0	130	----
QC-116684-003	SCP SS-2	copper	7440-50-8	E440	123 mg/kg	99.4	70.0	130	----
QC-116684-003	SCP SS-2	iron	7439-89-6	E440	23558 mg/kg	106	70.0	130	----
QC-116684-003	SCP SS-2	lead	7439-92-1	E440	267 mg/kg	97.2	70.0	130	----
QC-116684-003	SCP SS-2	lithium	7439-93-2	E440	9.5 mg/kg	97.7	70.0	130	----
QC-116684-003	SCP SS-2	magnesium	7439-95-4	E440	5509 mg/kg	105	70.0	130	----
QC-116684-003	SCP SS-2	manganese	7439-96-5	E440	269 mg/kg	110	70.0	130	----
QC-116684-003	SCP SS-2	molybdenum	7439-98-7	E440	1.03 mg/kg	107	70.0	130	----
QC-116684-003	SCP SS-2	nickel	7440-02-0	E440	26.7 mg/kg	105	70.0	130	----
QC-116684-003	SCP SS-2	phosphorus	7723-14-0	E440	752 mg/kg	106	70.0	130	----
QC-116684-003	SCP SS-2	potassium	7440-09-7	E440	1587 mg/kg	122	70.0	130	----
QC-116684-003	SCP SS-2	sodium	7440-23-5	E440	797 mg/kg	112	70.0	130	----
QC-116684-003	SCP SS-2	strontium	7440-24-6	E440	86.1 mg/kg	99.0	70.0	130	----
QC-116684-003	SCP SS-2	thallium	7440-28-0	E440	0.0786 mg/kg	103	40.0	160	----
QC-116684-003	SCP SS-2	tin	7440-31-5	E440	10.6 mg/kg	97.7	70.0	130	----
QC-116684-003	SCP SS-2	titanium	7440-32-6	E440	839 mg/kg	129	70.0	130	----
QC-116684-003	SCP SS-2	uranium	7440-61-1	E440	0.52 mg/kg	103	70.0	130	----
QC-116684-003	SCP SS-2	vanadium	7440-62-2	E440	32.7 mg/kg	108	70.0	130	----

Page : 14 of 14
 Work Order : VA20C0497 Amendment 1
 Client : Covanta Burnaby Renewable Energy, ULC
 Project : Weekly Bottom Ash - Suite




Sub-Matrix: **Soil/Solid**

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report				
					RM Target Concentration	Recovery (%) RM	Recovery Limits (%)		Qualifier
							Low	High	
Metals (QCLot: 116684) - continued									
QC-116684-003	SCP SS-2	zinc	7440-66-6	E440	297 mg/kg	102	70.0	130	----
QC-116684-003	SCP SS-2	zirconium	7440-67-7	E440	5.73 mg/kg	104	70.0	130	----



Report To		Report Format / Distribution		Service Requested (Rush for routine analysis subject to availability)		
Company:	Covanta Energy	<input type="checkbox"/> Standard	<input type="checkbox"/> Other	<input checked="" type="radio"/> Regular (Standard Turnaround Times - Business Days)		
Contact:	Steve McKinney / Dan Skrypnik	<input checked="" type="checkbox"/> PDF	<input type="checkbox"/> Excel	<input type="checkbox"/> Digital	<input type="checkbox"/> Fax	
Address:	5150 Riverbend Drive	Email 1:	smckinney@covanta.com		<input type="radio"/> Priority (2-4 Business Days) - 50% Surcharge - Contact ALS to Confirm TAT	
	Burnaby BC	Email 2:	rjohnson4@covanta.com		<input type="radio"/> Emergency (1-2 Bus. Days) - 100% Surcharge - Contact ALS to Confirm TAT	
Phone:	604-521-1025	Fax:	dskrypnik@covanta.com		<input type="radio"/> Same Day or Weekend Emergency - Contact ALS to Confirm TAT	
	<input type="checkbox"/> Yes <input type="checkbox"/> No		brent.kirkpatrick@metrovancover.org		Analysis Request	
			Sarah.Welman@metrovancover.org			

Invoice To Same as Report ?		Client / Project Information		Please indicate below Filtered, Preserved or both (F, P, F/P)							
Hardcopy of Invoice with Report?	<input type="checkbox"/> Yes <input type="checkbox"/> No	Job #:									
Company:		PO / AFE:	PO# 46693 Weekly Bottom Ash - Suite								
Contact:		LSD:	(includes 2:1 pH)								
Address:		Quote #:									
Phone:											

Lab Work Order # (lab use only)		ALS Contact:	Sampler:		MET-TCLP-VA (all metals, Hg)		MOISTURE	Chrome 6	MET-CSR+FULL-VA (all metals)		Number of Containers
Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type							
BA2045-A-1	<div style="border: 1px solid black; padding: 5px;"> <p align="center">Environmental Division Vancouver</p> <p align="center">Work Order Reference VA20C0497</p>  <p align="center">Telephone : + 1 604 253 4188</p> </div>	04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-2		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-3		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-4		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-5		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-6		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-7		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-8		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-9		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-10		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-11		04-Nov-20	9:00	Soil	X	X			X		1
BA2045-A-12		04-Nov-20	9:00	Soil	X	X			X		1

Special Instructions / Regulations with water or land use (CCME-Freshwater Aquatic Life/BC CSR - Commercial/AB Tier 1 - Natural, etc) / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as provided on a separate Excel tab.

Also provided on another Excel tab are the ALS location addresses, phone numbers and sample container / preservation / holding time table for common analyses.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date (dd-mmm-yy)	Time (hh-mm)	Received by:	Date:	Time:	Temperature:	Verified by:	Date:	Time:	Observations: Yes / No ? If Yes add SIF
<i>[Signature]</i>	10-Nov-20	0900	<i>[Signature]</i>	11/10/20	1:35	17°C				

17°C, 18°C No Ice